# Some Phylogenetic Conclusions on the Eurygeniinae (Coleoptera: Anthicidae), with a Review of the North American Species of Eurygenius Including the Description of a New Species (E. darlingtoni) from Texas

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Cain and Harrison (1960) and Crowson (1965) have adequately discussed the principles of phyletic weighting so I shall not discuss them here. Studies of the Anthicidae and related families (especially Pyrochroidae and Meloidae) of the Heteromera have led me to believe that within the Anthicidae, the Pedilinae and Steropinae are primitive, Eurygeniinae and Anthicinae are the most highly evolved, while Copobaeninae and Macratriinae are more or less intermediate (Abdullah, 1966 b and thesis). Every group has some primitive characters (which could be traced back to the Pyrochroidae or even Pythidae) and some derivative characters (which may even persist in the Meloidae) (*vide* Abdullah, 1965 a–f).

Within the Eurygeniinae (*sensu mihi*), the following are the primitive characters: eyes entire; antennae eleven segmented; neck wide (i.e., width more than half that of head across tempora); pronotum without a distinct apical flange or collar (e.g., *Mitraelabrus* Solier, 1851); mesepisterna meeting or nearly so in front of mesosternum; hind wing with radial and anal cells closed; hind coxae contiguous or nearly so (i.e., separated by a distance usually not more than length of a coxa); internal keel of hind coxa reduced to a narrow-based apophysis; tarsal claws appendiculate (as in *Steriphodon* Abeille, 1894); legs without ctenidia in the male; metasternum not spinous in the male; and abdomen without ventral appendages near base in the male.

In my opinion, the following are the derivative features of the Eurygeniinae: eyes emarginate; antennae twelve-segmented (e.g., *Mastoremus* Casey, 1895); apical (i.e., fourth) segment

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of maxillary palp cultriform (e.g., *Stereopalpus* Ferté-Sénectère, 1849 and *Steriphodon*) or large (e.g., *Pergetus* Casey, 1895); front coxal cavities internally or externally closed behind (e.g., Ictistygnini); pronotum apically flanged; elytra similar in both sexes; wing without a radial cell (e.g., *Qadrius* Abdullah, 1964) and anal cell absent; tarsal claws simple; legs with ctenidia in the male (e.g., *Retocomus* Casey, 1895 and *Mitraelabrus*); metasternum spinous in the male (e.g., *Duboisius* Abdullah, 1961 and *Retocomus*); metendosternite with the anterior tendons arising on the laminae or at their junction with arms (e.g., *Steriphodon* and *Mitraelabrus*); abdomen with appendages in the male (e.g., *Steriphodon*); first two visible sterna connate (e.g., *Lagrioida*); aedeagus with the parameres fused throughout their lengths; and ovipositor with the coxite non-segmented or incompletely two-segmented (*vide* Abdullah, 1966 a and b). The evidence on which any phylogenetic conclusion is based is never complete in the sense that there is always the possibility of new discoveries or interpretations which may lead to a stronger belief in what appears to be reasonable at present or to such modifications as are justified in the interest of science and truth.

Considering the type-genus, *Eurygenius* Ferté-Sénectère, 1849, it may be said that the absence of an apical flange on the pronotum or the presence of non-palpiform galea would separate this genus (and its allies in the Eurygeniini) from the Mitraelabrini. The major distinction from the Ictistygnini (e.g., *Ictistygna* Pascoe, 1866, *inter alia*—Lagriidae *auctt.*) lies in the externally (i.e., visibly) open front coxal cavities. The fourth and recently discovered tribe (Lagrioidini) is unique in the Anthicidae in having the first two visible abdominal sterna connate (Abdullah & Abdullah, ms.). *Eurygenius*, as it stands, is a heterogeneous group and the Old World species would probably have to be placed elsewhere. The discovery of the male of the type-species (*E. reichei* Ferté-Sénectère, 1849) known from a single female specimen deposited in the Muséum National d'Histoire Naturelle, Paris, would probably establish the affinities of the genus near *Duboisius*, *Retocomus* and *Mastoremus*, but this remains to be confirmed. Several species

formerly placed here have been transferred to other genera with the understanding that they could not have evolved from *E. reichei* or from an immediate common ancestor. The old grouping constituted an artificial or polyphyletic assemblage. These species are listed below with their original names followed by their new names: *E. arizonensis—Duboisius arizonensis* (Champion, 1916) Abdullah, 1964 c; *E. campanulatus—Pergetus campanulatus* (LeConte, 1874) Casey, 1895; *E. constrictus—Retocomus constrictus* (LeConte, 1852) Casey, 1895; *E. fulvopictus—Pseudostereopalpus fulvopictus* (Champion, 1925) Abdullah, 1964 b; *E. horridus—Rilettius horridus* (Champion, 1890) Abdullah, 1964 a; *E. lanuginosus—D. lanuginosus* (Champion, 1890) Abdullah, 1964 c; *E. mexicanus—D. mexicanus* (Champion, 1890) Abdullah, 1964 c; *E. murinus—R. murinus* (Haldeman, 1843) Casey, 1895; and *E. wildii—R. wildii* (LeConte, 1855) Casey, 1895.

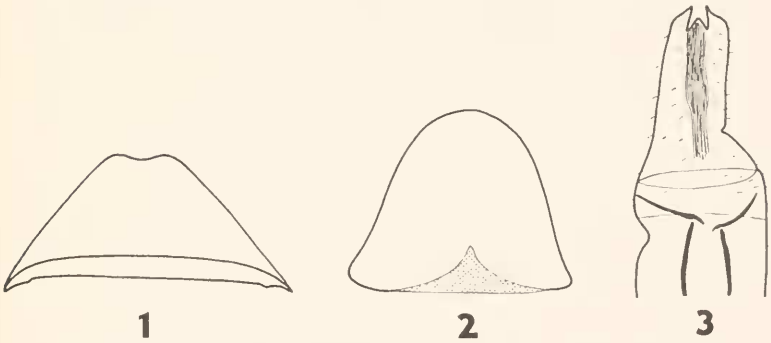
In an earlier paper on North American *Eurygenius,* the following statement was made by Fall (1929): "Notwithstanding the rejection of *Retocomus* in the Leng List and the continuance of our species under *Eurygenius,* I am quite convinced after a careful study of La Ferté's generic descriptions and figures that if the characters on which his *Eurygenius* and *Stereopalpus* are based are accepted as of generic rank, then the course pursued by Casey is the only logical one." My own researches support the view (Abdullah, 1964 b and d, 1965 f, and 1966 b). The genus *Eurygenius* Ferté-Sénectère, 1949, includes three species in North America, two of which were described by Fall (1929) and one which has come to my attention relatively recently and is being described here.

The distinguishing features of *Eurygenius* are: pubescence uniform or dimorphic on elytra; tempora reduced; apical (i.e., fourth) segment of maxillary palp usually securiform to subcultriform; eyes entire, large, protuberant, hairy; antennae filiform, apical (i.e., eleventh) segment slightly longer than tenth segment; pronotum not campanulate, widest subapically above middle, slightly longer than wide, surface sculpture visible; mesepisterna meeting in front of mesosternum; wing with anal cell usually closed; in female, seventh abdominal sternum usu-

ally with a dorsal hook-like process subapically, and seventh tergum usually with three apical lobes. Males of only two species are known and for their characters see Figs. 5–11 and 17–22.

KEY TO THE NORTH AMERICAN SPECIES OF EURYGENIUS

1. California; in the female, seventh abdominal sternum truncate or very weakly emarginate (Fig. 23); for the male, see Figs. 17–22.....**E. perforatus** Fall, 1929
   Texas; in the female, seventh abdominal sternum distinctly emarginate (Figs. 1, 12).....2
2. Seventh abdominal tergum entire and without lobes at apex (Fig. 2).....**E. darlingtoni,** new species
   Seventh abdominal tergum deeply emarginate and with three lobes at apex (Figs. 14, 15).....
   .....**E. parvicornis** Fall, 1929




FIGS. 1–3. (1) *Eurygenius darlingtoni,* new species, holotype, female: 1, seventh (abdominal) sternum; 2, seventh tergum; 3, apex of ovipositor, ventral view.

(1) **Eurygenius darlingtoni,** new species (Figs. 1–3)

♀ (*Holotype*) (author's no. 520), U. S. A., TEXAS, Terrell County, 5 miles west of Sanderson, June 12, in the Museum of Comparative Zoology, Harvard University, Cambridge, Mass.

*Color.* Brown, head and pronotum dark, eyes reddish brown, elytra with white spots.

*Vestiture.* Pubescence sparse, not completely concealing surface sculpture below, yellowish-white, dimorphic, decumbent,

irregularly macroscopically clustered on elytra, responsible for maculations; erect (flying) hairs present on tempora and pronotum.

*Head* widest across eyes, slightly narrower than pronotum at its widest part; apical segment of maxillary palp subcultriform; apical segment of labial palp nearly filiform. *Thorax.* Pronotum with median sulcus visible, line not impressed; wing with anal cell nearly closed. *Abdomen.* Seventh (i.e., fifth visible) sternum emarginate at apex (Fig. 1); seventh tergum entire at apex (Fig. 2); apex of ovipositor as in Fig. 3, styli (probably artificially) broken off.

Length, 8.5 mm.

The male of this species remains to be discovered. The female is unique in the genus (*s. str.*) in lacking apical lobes on the pygidium (or seventh tergite). I have much pleasure in naming this species in honor of Dr. Philip J. Darlington, Jr., of the M. C. Z., Harvard University, in appreciation of his assistance in my research studies.

(2) **Eurygenius parvicornis** Fall, 1929 (Figs. 4–16)

*Eurygenius parvicornis* Fall, 1929, pp. 333–334.

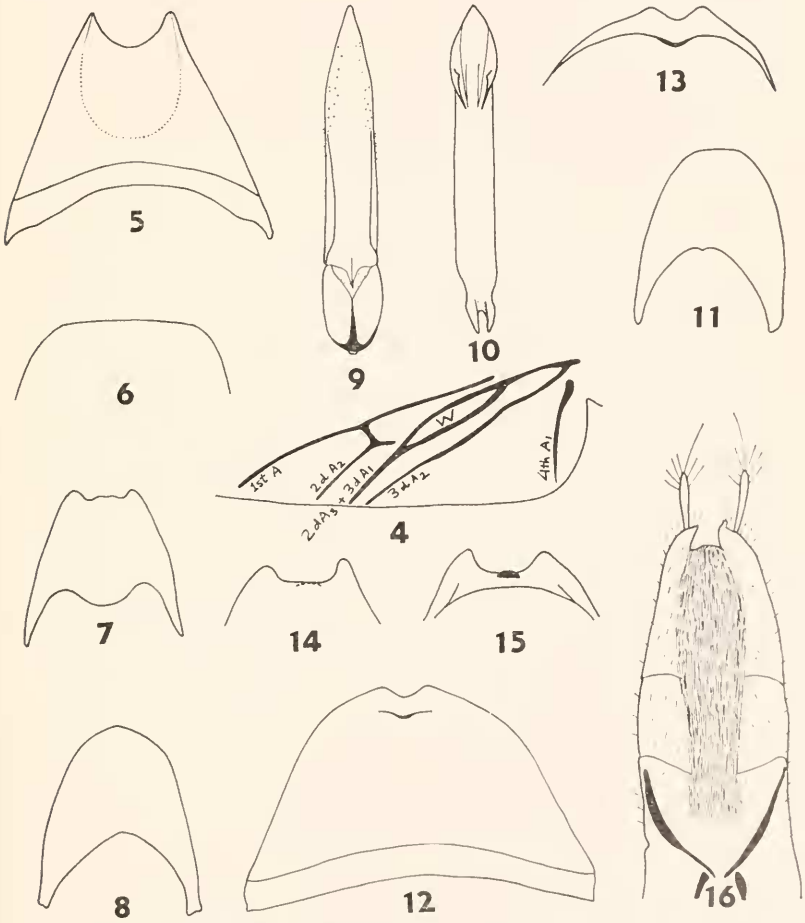
♂ (author's no. 518), U. S. A., Texas, Pecos County, 2 miles east of Sheffield, July 5 (J. J. duBois), in the California Academy of Sciences, San Francisco.

*Color.* Brown, head piceous but eyes reddish brown, pronotum dark.

*Vestiture.* Pubescence uniform, ashy white, decumbent, not contributing to over all appearance. Metasternum not spinous.

*Head* widest across eyes, slightly wider than pronotum at its widest part. Apical segment of maxillary palp subcultriform. Apical segment of labial palp nearly filiform or weakly securiform. *Thorax.* Pronotum with median sulcus distinct, line not impressed. Wing with anal cell closed (Fig. 4). *Abdomen.* Seventh sternum emarginate, sparsely spinous, rather pointed at apices, subapical median depression slight (Fig. 5); seventh tergum entire at apex (Fig. 6); eighth ster-

num with two weak, central processes and two strong lateral processes at apex, latter longer than former (Fig. 7); eighth tergum entire, slightly pointed at apex (Fig. 8) form variable,




Figs. 4–16. (2) *Eurygenius parvicornis* Fall, 1929: 4, portion of hind wing; 5, seventh sternum of male; 6, apex of seventh tergum of male; 7, eighth sternum of male; 8, eighth tergum of male; 9, tegmen of male, ventral view; 10, median lobe of male, ventral view; 11, eighth tergum of male; 12, seventh sternum of female, ventral view; 13, apex of seventh sternum of female, dorsal view; 14, apex of seventh tergum of female, dorsal view; 15, apex of seventh tergum of female, ventral view; 16, apex of ovipositor, ventral view.

rounded in others (Fig. 11); parameres tapering at apex; spines along lateral margins slender, short, numerous and irregular, those on dorsal surface appearing as punctures in a ventral view, with a median sulcus near base; basal-piece with a median ventral ridge and a dorsally curved median process at basal end (Fig. 9); median lobe as in Fig. 10.

Length, 6 mm.

♀ (author's no. 521), U. S. A., TEXAS, Terrell County, Sanderson, May 18 (M. A. Embury), in the C. A. S., San Francisco. Differs from the male as follows: head nearly as wide as pronotum; seventh abdominal sternum emarginate at apex, with a dorsal ridge (Figs. 12 and 13); seventh tergum emarginate at apex, with a small, median ventral process scarcely visible in a dorsal view (Figs. 14 and 15); apex of ovipositor as in Fig. 16. Length 7 mm.

Type locality: U. S. A., TEXAS, Davis Mountains, Fort Davis Quad., Phantom Lake.

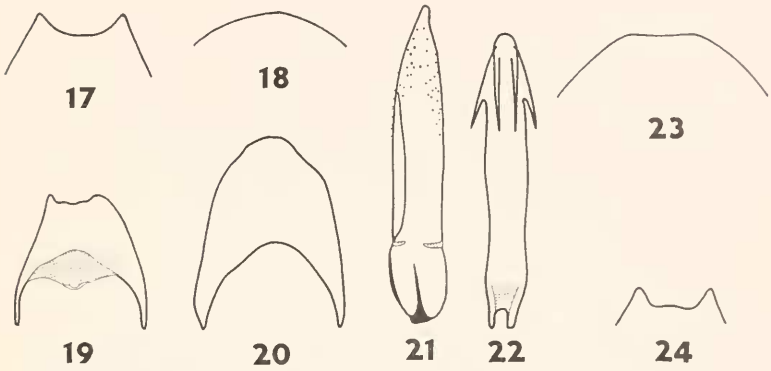
Records and Variation. U. S. A., TEXAS, Davis Mountains, Jeff Davis County, Fort Davis Quad., Phantom Lake, 1 ♂ (paratype), June 20 (F. M. Gaige), in the M. C. Z., Harvard University. Five miles west of Sanderson, Terrell County, 1 ♀, July 12, at Cornell University, Ithaca, N. Y.; 1 ♀, at Lund University, Sweden. Sheffield, Pecos County, 1 ♂, in the C. A. S., San Francisco; 1 ♂, 1 ♀, July 24, in the British Museum (Natural History) London; 1 ♂, in the Muséum National d'Histoire Naturelle, Paris; 2 miles east, July 6 (J. J. duBois), at Cornell University. State label only, 1 ♀ (G. H. Horn), in the Academy of Natural Sciences of Philadelphia, Penna.

Varies considerably: color light brown to dark brown; pronotum not too weakly constricted near middle; elytra maculate to nearly immaculate. Length varies from 5.5 to 6.5 mm among males and from 6.5 to 8.5 mm among females.

Collection dates: May 18 to July 24.

♀ (*Paratype*) (author's no. 607), U. S. A., CALIFORNIA, Riverside County, Palm Springs, August 30 (A. C. Davis), in the M. C. Z., Harvard University. Differs from the male as follows: seventh abdominal sternum very weakly, broadly, emarginate at apex, with a dorsal ridge (Fig. 23); seventh tergum

with three apical lobes, central one small and ventrally curved (Fig. 24). Length, 6 mm.




Figs. 17–24. (3) *Eurygenius perforatus* Fall, 1929, paratypes: 17, apex of seventh sternum of male; 18, apex of seventh tergum of male; 19, eighth sternum of male; 20, eighth tergum of male; 21, tegmen of male, slightly ventrolateral view; 22, median lobe of male, ventral view; 23, apex of seventh sternum of female, ventral view; 24, apex of seventh tergum of female, dorsal view.

(3) **Eurygenius perforatus** Fall, 1929 (Figs. 17–24)

*Eurygenius perforatus* Fall, 1929, p. 334.

♂ (*Paratype*) (author's no. 606), U. S. A., California, Riverside County, Palm Springs, August 30 (A. C. Davis), in the M. C. Z., Harvard University.

*Color.* Light brown, labrum yellow, apices of mandibles black.

*Vestiture.* Pubescence uniform, yellowish white, decumbent, sparse, not contributing to over all appearance; metasternum not spinous.

*Head* widest across eyes, nearly as wide as pronotum at its widest part; apical segment of maxillary palp weakly subcultriform (apparently filiform); apical segment of labial palp weakly securiform. *Thorax.* Pronotum with median sulcus indistinct; wing with anal cell closed; punctures on elytra coarser and denser than in *E. parvicornis*. *Abdomen.* Seventh sternum emarginate, sparsely spinous at apex (Fig. 17);

seventh tergum entire at apex (Fig. 18); eighth sternum with two very weak central processes and two strong lateral processes at apex, with a small (*Retocomus*-like) sclerite at base, membranous above it (Fig. 19); eighth tergum entire, slightly narrowed at apex (Fig. 20); parameres tapering and narrowed at apex, spines along lateral margins slender, short, numerous and irregular, those on dorsal surface appearing as punctures in a ventral view; weakly, medially sulcate at base, basal-piece with a median ventral ridge and a dorsally curved median process at basal end (Fig. 21); median lobe as in Fig. 22.

Length, 5 mm.

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